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DXIII.—BOTANICAL ENTERPRISE IN BRITISH HONDURAS.

A botanic station was established in the neighbourhood of Belize, in British Honduras, by the Governor, Sir Alfred Moloney, K.C.M.G., in 1892 (*Kew Bulletin*, 1895, p. 10). The first curator was Mr. James McNair, who, under the supervision of the same energetic Governor, had laid the foundation of the successful station now existing at Lagos in West Africa.

Sir Alfred Moloney has recently issued a "Brief Outline of the Botanical Efforts of the Government of British Honduras." This gives an interesting account of the work of the station and of the part it is intended to play in aiding the economic development of the colony. Hitherto British Honduras has been largely dependent upon the cutting of mahogany and logwood. The former has, however, seriously declined of late years owing to the competition of so-called "mahogany" from West Africa. It is evident that other industries are necessary for the welfare of the colony, and the Governor has rightly drawn public attention to the means which appear to him to be most conducive to that end. If we trace the course of development of such colonies as Jamaica and Ceylon it is evident that the cultural industries must at the present time be selected with great judgment and care, having regard to the conditions of soil and climate, to the circumstances of local labour, and the opportunities offered for disposing of the produce. British Honduras is very favourably situated as regards soil and climate, and it has excellent communication with the Southern States of America. The Governor's efforts therefore deserve warm support from the general community, and there is little doubt that as soon as the rich lands in the interior of the colony are opened by the proposed railway considerable development will take place in the cultivation of coffee, cacao, fruit, and other tropical staples. The following extracts are taken from the Governor's statement:—

In 1882 the question of establishing in Belize or in some other part of the Colony a Botanic Station was put forward by Sir Joseph Hooker, K.C.S.I., C.B., then director of the Royal Gardens, Kew, for the consideration of the Colonial Office.

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Although in 1884 the recommendation reached the stage of adoption by the Secretary of State for the Colonies, the scheme only took shape in September 1892.

The necessity for such an institution had been long recognised in the Colony in furtherance of the development of its cultural industries. In recognition of this want, and in deference to the popular feeling, I took advantage of the opening of the Legislative Council, on the 29th March 1892, to invite the intelligent interest and financial support of that body in the direction desired.

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It has become part of the general Colonial policy to encourage the production of varied staple articles of export of a more or less permanent character. In such a direction, more especially in agriculture, much has been done by the active interest and assistance of the authorities of the Royal Gardens at Kew to develop new industries, and to distribute plants of commercial importance. In furtherance of such views, there have been established in all our West Indian Possessions, Botanic Stations. Surely the time has come for a similar institution in a Colony which has such exceptional advantages, whether we look to climate, soil, or a market. It has been with some justice advanced that British Honduras can be made the Tropical Garden of North America.

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The products of our cultural industries, still really in their infancy, are chiefly represented by bananas, plantains, cocoanuts, coir, coffee, henequen, Indian corn, limes, mangoes, oranges sour and sweet, pineapples, avocado pears, rubber, to which there should be added, in time, arnatto, cacao, ground-nut, indigo, jute, ramie, spices, manila, and doubtless other marketable commodities.

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There resulted the unanimous acceptance and passing by the Legislature of an Ordinance No. 1 of 1892, to provide for the establishment of a Botanic Station.

This Ordinance empowered the Governor-in-Council to make from time to time Rules:—

(1.) For the management, government, and control of the station, and of the officers appointed in connexion therewith.

(2.) For the distribution of plants therefrom.

(3.) Generally for encouraging and promoting the use and efficiency of the Botanic Station as a means of education in all matters appertaining to agriculture and horticulture.

Provision of 1300 dollars, made up of 300 dollars for a gardener and 1000 dollars for the maintenance of the grounds of Government House, had been previously made in the annual Estimates under 'Governor and Councils.'

In 1892 that provision was supplemented by 1000 dollars, and the aggregate credited to the Surveyor-General's Department under the new heading 'Botanic Centre.'

The following is the Report of the Committee appointed to recommend a suitable site for the establishment of the Central Botanic Station:—

SIR, "Belize, 29th December 1893.

THE committee appointed to decide on the most suitable site for a botanic station have the honour to report:—

1. Having considered the various sites proposed they are in favour of the one offered by the British Honduras Syndicate at Hope Creek, in the Stann Creek district.
2. The committee having in view the probable extension of the agricultural development of the colony, which is likely to take place, by the creation of convenient stations, from which economic plants can be readily obtained, would respectfully suggest that the offer of Messrs. Price Brothers to grant 25 acres of land, in fee, at Kendal, on the Sittee River, be also accepted as an auxiliary station to the one at Hope Creek.
3. The committee would beg further to suggest that about 50 acres of Crown land, in the vicinity of Hope Creek, be reserved for the present, in connexion with the scheme under consideration and pending the results of carrying out their report.

I have, &c.,
J. H. Phillips,
Chairman of the Committee."

The services of a qualified and experienced superintendent in the person of Mr. J. McNair were secured from Jamaica at a salary at the rate of 100*l.* per annum, rising to 130*l.* by an annual increment of 10*l.*, with a house. He arrived on the 9th September 1892, when he assumed the duties of his office as superintendent of the Botanic Station of the Colony, and began his work.

The main object of this initial effort was to establish a distributing centre of economic plants of marketable value, where the wants of small and extensive cultivators could be met.

The site devoted to the purpose was an acre of land appropriated to the use of the public from the grounds of Government House, and which formerly embraced the kitchen garden of the Governor. A suitable cottage in it was appropriated to the use of the superintendent.

It was at the time appreciated that the growing requirements of the colony would necessitate the removal, in time, of the central station to a more suitable site, in one of the rich and protected river valleys, where it could be developed into a general botanic department with a branch as an experimental farm, or in some other form on the chief river of each district.

Steps were accordingly taken to acquire and reserve suitable sites to meet such possible extension.

In such directions the following free grants have been generously made :—

(*a.*) By the British Honduras Syndicate, 75 acres of very fine land, well watered and fairly well provided with shade trees, on Hope Creek, North Stann Creek River, about north of Melinda, which is approached from the sea at Stann Creek by a tram line of some six miles in length, the free use of which is to be allowed to the employés of the station as well as to visitors. This site is also approachable from the sea by the North Stann Creek River.

(*b.*) By E. A. H. Schofield, Esq., 10 acres situated on the San Andres Road, Corosal, and about half a mile from that town ; it is approached from the sea, and has adjacent two rivers, the Hondo and New River, by which plants can be distributed throughout the Corosal and Orange Walk districts.

(*c.*) By Messrs. Price, Brothers, 25 acres at their estate of Kendal, and abutting on the Sittee River, where the waters are abundant and fresh.

(*d.*) By Messrs. Arnold Brothers, 25 acres have also been reserved on the Temash River, in the Toledo District, where the land is of the richest in the colony.

The existing station would remain, and continue to serve as a distributing centre for the Belize and Cayo districts.

The Hope Creek section has been recommended by an able and experienced committee, appointed for the purpose, as the most suitable and convenient site for the general central station of the colony. Sections (*a*), (*b*), and (*c*) have been surveyed, and the two first conveyed to the Government.

It was also considered that the existing station would serve not only as a nursery for the raising and distribution of seedlings, both indigenous and exotic, of economic marketable value, but also might be utilised and resorted to as a practical school for the agricultural education of youths whom planters wish to have trained to serve as gardeners in plantation nurseries, at their own expense as regards lodging and maintenance. So far the hope of the Government in this direction has not been realized. Nor have apprentices been induced to come forward, although applications for them, with the offer of 7.50 dollars (sols) per month have been made in the Government Gazette.

It would be in the interest of the colony to send to Hope Garden, Jamaica, a couple of Creole youths to be trained as gardeners, so that after an apprenticeship of three years they might be able to take charge of sub-stations which would be later established.

In this direction the co-operation of the Government of Jamaica has already been invited.

In support and furtherance of the aim and objects of the Botanic Centre, an Agricultural Society has been established under the provisions of Ordinance No. 23 of 1894, for the purpose of promoting the general interests of the agricultural classes and the industries of the colony.

In the first instance, the society has been constituted by the appointment of a committee of 12 persons, with the Governor as president, and an honorary secretary, representative of the wood, fruit, cane, cacao, coffee, and other economic industries.

The duties undertaken by the committee are :—

(*a.*) To consider all questions affecting the agricultural interests of British Honduras, and to communicate with the Government or otherwise as may seem necessary;

(*b.*) To hold, as may be deemed advisable, agricultural shows and exhibitions of agricultural produce, live stock, machinery, implements, harness, rolling and other dead stock, &c.;

(*c.*) To encourage ploughing, forking, and other labour competitions;

(*d.*) To promote (as the society may deem advisable, and as its funds and powers permit) by means of discussion, prizes, publication of papers, researches and inquiry, reports and application to the Government, and by any other proper and lawful action, the supply, employment, and welfare of agricultural labourers, the collection and publication of statistics, the dissemination of information on all matters relating to agriculture, and the general interests of the agricultural industries of British Honduras.

The necessary legislation (Ordinance No. 24 of 1894) has also been added to the Statute Book against the introduction into the Colony of diseases in plants.

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As a temporary expedient, until it developed sufficiently to stand by itself as a department, the station as regards its staff has been placed

under the Surveyor General, whose officers, scattered as they are over the Colony, would be in a position to further the interests of the Station by contributing from time to time useful plants and seeds.

In the promotion of the distribution in the Colony of *Coffea arabica* and *Coffea liberica*, and other seedlings, the co-operation of the religious denominations and commissioners has been invited, and plants free of cost have been placed at their disposal.

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The Royal Gardens, Kew, and the Botanical Department, Jamaica have been constant and generous in their supply of plants and seeds.

From the report for the quarter ended 31st December 1894, it appears that 1,844 plants are in their permanent places, whilst 9,422 in beds and pots remained available for the public.

The issues have amounted to 25,024, of which 16,829 have been sold and 8,195 given away free.

Amongst these were 19 Nutmeg, 597 Cocoanut, 23,795 Coffee, 49 Cacao, 68 Casuarina, 136 Roses.

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Guided by experience, agriculturists may, I think, accept as products which from a commercial point of view can be profitably grown :—the avocado pear, banana, cacao, coffee (*arabica* for the highlands, *liberica* for the lowlands), cane, rubber (*Castilloa elastica*), cocoanuts, cola nuts, cotton, grape fruit, ground nut, henequen, jute, lemon, lime, nutmeg, pineapple, plantain, pimento, sapodilla (which yields the chewing gum used in the United States), shaddock, tobacco, and vanilla.

As to what are generally called "Kitchen Garden Products" it may be convenient to know that there grow luxuriantly in this Colony the Jerusalem artichoke, asparagus, beans of various kinds, cabbage, carrot, cauliflower, celery, corn, cucumber, edible gourds, Indian kale, lettuce, melon, mint, ochro (widely used in gombo soap in the United States), parsley, potatos (ordinary and sweet), pea, spinach, tomatos.

With such a list as I have mentioned, it seems well-nigh incredible that vegetables have to be imported from New Orleans, some 850 miles away, and that that city is our source of supply instead of being our market.

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The station was opened, as already stated, in September 1892. Quite one-half the area had to be reclaimed and raised 2 feet in some parts. It began to be productive in April 1893.

The experiment has cost the Colony, for 1892–4, $1,429·40, or £159, a bagatelle compared with the value to the Colony of the economic plants distributed, of the hygienic tree planting that has taken place, and of the practical instruction given by the superintendent.

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The continued fall in the price of mahogany has resulted in closing nearly all the mahogany works. The richer and healthier lands are not sufficiently accessible to permit agriculture being entered upon with success, consequently the Colony finds itself now almost entirely dependent upon one source of wealth, viz., the logwood industry.

The dangers of relying upon one trade are obvious, especially one like logwood, which may at any time be brought to ruin by a chemical discovery in the manufacture of dyes. There is no exaggeration in stating that a collapse in this industry would throw out of employment hundreds, depopulate the Colony, and paralyse its trade and revenue.

ALFRED MOLONEY,
Governor.

DXIV.—SUGAR-CANE DISEASE IN BRITISH GUIANA.

The rind disease due to a fungus, *Trichosphæria sacchari*, which is doing so much damage to the sugar-cane in the West Indies, is discussed in the *Kew Bulletin* for 1895 (pp. 81–88), where references are given to preceding articles.

The following notice taken from the *Demerara Argosy* of November 16 records the existence of the disease in British Guiana, and its probable effect on the crop. It is satisfactory to observe that the systematic burning of the diseased canes is advocated as recommended in the *Kew Bulletin* for 1893 (p. 152). But the further precaution is necessary of taking scrupulous care only to use perfectly healthy canes for propagation, *Kew Bulletin*, 1893 (p. 348).

"Although a few showers have fallen throughout the colony, considerably heavier in some places than in others, the drought cannot yet be said to have ended, and more rain is anxiously awaited. To add to the distress which has hung like a thick cloud over our sugar industry for several years, the rind-fungus has appeared among the canes and is causing a loss of juice that is variously estimated at from 10 to 20 per cent. A leading planter informs us that the quality of the juice is not affected by the fungus, as is the case when canes attacked by the borer are crushed along with good canes; but the quantity is seriously affected, the portion of the cane which the fungus has attacked having nothing left in it but fibre. At the Royal Agricultural Society's meeting on Thursday the question was discussed, and Mr. Howell Jones expressed the opinion that by leaving none of the diseased canes in the field, and burning all the megass from the cane mill, the fungus would be prevented from spreading and soon be eradicated. Athough the disease is said not to affect the quality of the juice, the crushing throughout the colony generally is giving results in saccharine richness somewhat under those of the corresponding period of 1894. But probably the juice will intensify as the season advances; and let us hope that the market will follow suit. At present dark sugar is fetching $2.20 in the street for American refiners, a price which is better than the worst, but far too low to be regarded with satisfaction."

The following letter from the Government analyst gives a valuable account of the extent of the disease and the measures taken for its control:—

Mr. J. B. Harrison to Royal Gardens, Kew.

Government Laboratory, Georgetown,

Dear Sir, Demerara, March 3, 1896.

Mr. Jenman has shown to me your letter to him concerning the prevalence of rind disease in this colony, and the alleged apathy with which its appearance has been treated by the colonists. From your letter I am inclined to think that you are not in possession of all the facts relative to this matter.

Since the first accounts of the prevalence of this disease in the West Indian Islands reached the colony the keenest interest has been taken in the matter by the planters, and from time to time many of the managers have visited Barbados and inquired into the state of affairs there. It was not, however, until you kindly supplied us with copies of Mr. Massee's paper that we were able to recognise the fungus therein described as one constantly present in the tissues of dead and dying canes in this colony, no matter how their death was caused. From that

time the leading attorneys and managers have kept the closest watch on the canes under their charge in order to detect any outbreak of disease. This first appeared, as far as I am aware, among some seedling canes which had been kept over their ripening period for a special reason (January, 1894). In May and June of that year canes were sent to me from the west coast of Demerara and from the west coast of Essequibo showing unmistakable signs of the disease, whilst later in the year (October and November) canes exhibiting the diseased condition were received by Mr. Jenman and myself in larger numbers and from other localities. In these months it was first noticed to be present to a serious extent in a few fields in West Demerara and West Essequibo. The fields affected were, upon my advice, burnt before cutting, reaped as rapidly as possible and the actually diseased canes destroyed in the combustion chambers of the estates' megass furnaces. The fields worse affected were thrown out of sugar cultivation. In December of 1894 I received instructions to visit the West Indian Islands and to consult with the botanists and chemists who had studied this disease. This I did, and visited Trinidad, St. Vincent, Barbados, and Antigua, as well as Grenada and the island of Carriacou where the cultivation of sugar has been abandoned since 1867. Even in the last-mentioned place I found canes affected with the rind disease. After my return I learned that estates in East Demerara had also suffered slightly from the disease. During the earlier part of last year few cases of its prevalence were brought to our notice, but I received from plantations in Essequibo and Demerara specimens affected with the "root fungus" and also with a peculiar disease causing "clubbing" of the roots. In October and November last it became apparent that large areas of canes were more or less affected in east and west coasts of Demerara, in the Essequibo islands, and on the coast of Essequibo. The estates on the banks of the rivers have not suffered to any extent, whilst the Berbice ones have apparently escaped. At present, canes everywhere seem free from it, but if we suffer from drought I have no doubt it will reappear. As long as we had constant wet seasons the disease remained unnoticed; it is during periods of drought that it occurs. At the Agricultural Committee this disease has been a constant theme of discussion since it first appeared in the islands. I have visited several of the estates where it has been most prevalent, and found that it is practically common only on the front lands of the estates, which have been under continuous cane cultivation for many years, the richer back lands being free from it.

On all estates, as far as I can ascertain, every care has been taken to destroy all diseased canes, and this is far easier to do completely here than in the islands.

I may mention that during my visit to the islands I was forced to the conclusion that the effects due to fungus disease had been greatly exaggerated, as all defects arising from climatic or cultural defects, insect attacks, want of manure and unsuitable soils, had been recently ascribed to the fungus. One manager in St. Vincent informed me that whilst the fungus was injurious to the owners it was a godsend to the managers, as through it they could explain all things which were wrong.

But with regard to this Colony, where the managers of sugar estates are men of an entirely different type to those in the West Indian Islands, I can assure you that there has been no tendency to "pooh pooh" the disease, and that every effort possible is being, and has been, made for its eradication. We have, perhaps, devoted ourselves more to the study of the conditions which have allowed it to spread so rapidly and

to the chemical changes produced by it than to purely theoretical points in connexion with it, and have refrained from allowing ourselves to fall into the state of despondency which characterised several of the West Indian Islands.

I quite agree with your views regarding seedling canes. As far as my observations have gone no variety of cane is immune from the attacks of this fungus, provided that the health of the cane is weakened in any way, and that it suffers from insect attack or other mechanical injury to its tissues.

I remain, &c.
(Signed) J. B. Harrison.

N.B.—No canes have been introduced into this Colony from Barbados or elsewhere since May or June, 1890. It is not likely, therefore, that the disease has been recently introduced into the Colony.

W. T. Thiselton-Dyer, Esq., C.M.G.

DXV.—HAND-LIST OF CONIFERÆ GROWN IN THE ROYAL GARDENS.

The preface of this publication, which is on sale in the Royal Gardens, is reproduced :—

The present Hand-list might properly have formed part of that of the "Trees and Shrubs grown in the Arboretum," but so many persons possess collections of Conifers who are not interested in other ligneous plants that there was an obvious convenience in treating them separately. There was the further advantage that this enabled the species which are grown under glass to be included. The natural order, or rather group, *Coniferæ*, is so well defined that it is desirable to enumerate in one list all the species actually in cultivation at Kew.

These comprise 227 species, with 340 varieties, belonging to 37 genera.

Sir Joseph Hooker, the late director of the Royal Gardens, had contemplated the preparation of a Catalogue of the Kew Pinetum. In view of it he had drawn up a brief review of the literature of the subject, which he has now, after revision, kindly permitted to be used :—

In the following list the species are referred to the genera under which they have been placed by the latest authorities, who have revised the order *Coniferæ*. That such an authoritative list should be published is the wish of all intelligent cultivators of these interesting plants, and its publication in this country is rendered all the more needful from the fact that the British cultivators alone persist in referring the Silver Firs to *Picea*, and the Spruces to *Abies*, a practice long abandoned on the Continent, and which has not been adopted in America. And if, as I hope, the current nomenclature will in future be adopted in regard to the Latin names of these genera, I would further urge a reform in respect of their English equivalents, in so far as to confine the use of the words Pine to the species of *Pinus*, of Spruce to those of *Picea*, and of Silver Fir to those of *Abies*. We should then be in accordance with the universal practice throughout North America, which is the head-quarters of all three genera, where a Pine is never called a Fir, nor a Fir called a Spruce, nor a Spruce a Pine.

The following historic sketch of the various essays of botanists to limit the genera and species of *Abietineæ*, shows how divergent have

been their views. I have endeavoured to make it more instructive, by giving (where there are materials for doing so) under each attempt the number of species known to its author, thus further showing the progressive discovery of species during the last hundred and eighty years or thereabouts.

Tournefort, in 1717, indicated the three genera, *Abies*, *Pinus*, and *Larix* (including *Cedrus*); and his *Cedrus* is *Juniperus*.

Linnæus, in 1753, included these all under *Pinus*, of which he enumerated 10 species.

In 1731 the first edition of *Miller's Gardener's Dictionary* appeared, where he has *Pinus*, *Cedrus*, *Larix*, and *Abies*, with 16 species in all.

In 1789 A. L. de Jussieu, in his *Genera Plantarum*, has only two genera, *Pinus* and *Abies*.

In the same year the first edition of Aiton's *Hortus Kewensis* appeared, wherein all the *Abietineæ* (19 species) are included under *Pinus*.

In 1803 was published the first edition of Lambert's *Genus Pinus*, containing about 35 species of *Abietineæ*, all included under *Pinus*.

In 1813 the second edition of the *Hortus Kewensis* appeared, in which, as before, all the *Abietineæ* (increased to 29) are included under *Pinus*.

In 1826 Louis Claude Richard's *Mémoire sur les Conifères* was edited by his son. This classical work is the earliest that dealt scientifically with the order *Coniferæ*, and in it the Tribe *Abietineæ* was first established, to include *Pinus* (under which were placed Spruces and Silver Firs), and *Larix* (which included the cedars), to these were added, *Cunninghamia*, *Agathis* (*Dammara*), and *Araucaria*, which now form a distinct Tribe.

In 1827 Link, in the *Journal of the Academy of Sciences of Berlin*, proposed the five genera: *Pinus*, *Picea* (for Spruces), *Abies* (for Silver Firs), *Larix*, and *Cedrus*.

In 1832 the second edition of Lambert's *Genus Pinus* appeared, wherein the *Abietineæ* were all, as before, included under *Pinus*; which however was broken up by David Don (Lambert's Herbarium keeper) into six sections, *Pinus*, *Strobus*, *Abies* (for the Spruces), *Picea* (for the Silver Firs and Tsugas), *Larix*, and *Cedrus*. About 48 species in all are described.

In 1838 Loudon's great work, the *Arboretum et Fruticetum Britannicum* appeared. The Tribe *Abietineæ* is here adopted as defined by Richard, with the genera *Pinus*, *Abies*, *Picea*, *Larix*, and *Cedrus*: and here that confusion of *Abies* and *Picea* which so distresses British foresters and planters had its origin. At. p. 2105 there is a clavis of the genera, where the genus *Abies* is attributed to Link, but the characters given to it are those of Link's *Picea*; and in like manner *Picea* is attributed to Link, though the characters given are those of Link's *Abies*, and they are followed by *D. Don* in brackets. Turning now to the full account of the genera, at p. 2293, we find "*Abies*, D. Don in Lamb. Pin. vol. iii." with the addition of "*Picea*, Link" as a synonym, followed by descriptions of the Spruces. And at p. 2329 we have "*Picea*, D. Don in Lamb. Pin. vol. iii." with *Abies*, Link, as a synonym; followed by descriptions of the Silver Firs. Now not only was the edition of Lambert's work subsequent to Link's establishment of *Picea* for Spruces and *Abies* for Silver Firs, but Don nowhere in Lambert's *Genus Pinus* proposed these names as generic. Disregarding this blundering, which probably originated in the elaboration of the conifers being a composite work of Don and Loudon working apart,

there remains but one argument for preferring Don's nomenclature, which is, that Linnæus called the Silver Fir *Pinus Picea* and the Spruce *P. Abies*, assuming that he was following the practice of the ancients, in which he is known to have been mistaken.

Owing to the great merit and utility of Loudon's *Arboretum*, his nomenclature has hitherto been universally adopted in the United Kingdom. It contains descriptions of about 70 species of *Abietineæ*.

In 1841 Link (in *Linnæa*, vol. xv., p. 481) reviewed the whole Tribe of *Abietineæ*, retaining, as before, *Pinus*, *Picea*, *Abies*, *Larix*, and *Cedrus*, and enumerating 52 species.

In 1841–46, Antoine's *Die Coniferen* appeared, in which all the *Abietineæ* are referred to *Pinus*, with sections of *Pinus* proper, *Larix*, *Cedrus*, *Picea*, Don, *Abies*, Don, and *Tsuga*; he describes 90 species.

In 1842 Spach, in his *Histoire Naturelle des Végétaux*, adopted *Pinus*, *Abies* (including under it as sections *Picea*, Link, *Tsuga*, and *Pseudotsuga*), *Cedrus*, and *Larix*.

Endlicher, in the same year, in his *Genera Plantarum* reverted to Linnæus' practice of including all under *Pinus*, but made four sections —*Pinus* proper, *Picea*, Link, *Abies*, Link, and *Larix*, including *Cedrus*.

In the same author's *Synopsis Coniferarum*, published two years later, he maintains the genus *Pinus* entire, as before, but subdivides it into 11 sections, with 109 species.

In 1850 Lindley and Gordon published (in the *Journal of the Horticultural Society*, vol. v.) "An enumeration of *Coniferæ* cultivated in Great Britain," where two genera only are adopted, *Pinus* and *Abies*, and the latter is subdivided into Firs (including Spruces), Larches, and Cedars, with 119 species.

Meisner in 1836–43 published his *Genera Plantarum Vascularum*, wherein he includes all *Abietineæ* under *Pinus*, with, as sections, *Pinus* proper, *Picea*, Link, *Abies*, Link, and *Larix*, including *Cedrus*.

In 1855 Carrière's *Traité général des Conifères* appeared; he keeps up *Pinus*, *Abies*, Link, *Picea*, Link, *Larix*, *Cedrus*, and *Tsuga*, which includes *Pseudotsuga*. This work enumerates 133 species, many of which are now ranked as varieties.

In 1858 appeared the first edition of *Gordon's Pinetum*, in which he maintains *Pinus*, *Abies*, Don (including *Tsuga* and *Pseudotsuga*), *Picea*, Don, *Larix*, *Cedrus*, and *Pseudolarix*. He enumerates 131 species, of which many are imperfectly known.

In 1865 Henkel and Hochstetter published their *Die Coniferen*, with the following arrangement, *Pinus*, *Abies* (including *Picea*, Link, *Abies*, Link, *Tsuga*, and *Pseudotsuga*), *Cedrus*, *Larix*, and the new genus *Pseudolarix*, Gord. They describe 130 species, which should be reduced much as Carrière's should be.

In 1867 the second edition of Carrière's *Traité* was published, in which all the genera of the first edition are retained together with *Pseudotsuga* and *Keteleeria*, and 153 species are described, excluding many dubious ones.

In 1868 Parlatore's monograph of the order appeared in the 16th volume of De Candolle's *Prodromus*. The genus *Pinus* is divided into two sub-genera, *Pinus* proper for the Pines, and *Sapinus*; which latter includes as sections only *Picea*, Link, *Abies*, Link, *Cedrus*, *Larix*, *Pseudolarix*, *Tsuga*, and *Pseudotsuga*. The species described are 162.

In 1875 the second edition of Gordon's *Pinetum* was published, in which the same genera are retained as in the 1858 edition, with 150 species.

Lastly, in the *Genera Plantarum* (1882), Mr. Bentham and I have distinguished *Pinus*, *Picea*, Link, *Abies*, Link, *Tsuga*, *Pseudotsuga*, *Larix*, and *Cedrus*, to which must now be added *Pseudolarix* and probably *Keteleeria*, both at that time very imperfectly known.

In 1886 Dr. M. T. Masters published (*Journal of the Linnean Society*, xxii. pp. 169–212, tt. 2–10, with 32 woodcut figures in the text) some "Contributions to the History of certain Conifers." This was followed in 1890 by a "Review of some points in the comparative Morphology, Anatomy, and Life History of the Coniferæ" (*Journ. Linn. Soc.*, xxvii., pp. 226–332, with 29 woodcut figures in the text), and in 1895 by "Notes on the Genera of *Taxaceæ* and *Coniferæ*" (*Journ. Linn. Soc.*, xxx., pp. 1–42).

In 1889, two years after his death, Dr. A. W. Eichler's elaboration of the Coniferæ appeared in Engler and Prantl's *Die Natürlichen Pflanzenfamilien*. He classifies the genera under two primary divisions: *Pinoideæ* and *Taxoideæ*. The former he again divides into *Abietineæ* and *Cupressineæ*, with several ternary divisions, and the latter into *Podocarpeæ* and *Taxeæ*. The genera are limited, with few exceptions, as they are by Bentham and Hooker; but he retains *Chamæcyparis*, *Thuiopsis* and *Pseudolarix*, and sinks *Pseudotsuga* in *Tsuga* and *Prumnopitys* in *Podocarpus*.

In 1891 L. Beissner published a *Handbuch der Nadelholzkunde*. This was preceded by a *Handbuch der Coniferen-Benennung* (1887), followed by two supplements (1891–2) on *Einheitliche Coniferen-Benennung*. Beissner deals critically with the numerous natural and garden varieties and hybrids. He has also paid much attention to nomenclature, though he accepts familiar names rather than revive obscure ones on the rule of priority.

In 1892 the Royal Horticultural Society held a "Conifer Conference," and the papers read thereat form the fourteenth volume of the *Journal* of the Society. This is one of the most interesting volumes issued by the Society, containing a great variety of valuable information concerning *Coniferæ*, including a general introduction and a list of the species cultivated in Great Britain and Ireland, by Dr. M. T. Masters, F.R.S.

In 1894 H. Baillon (*Histoire des Plantes*, xii. pp. 1–15) published an account of the order, with a synopsis of the genera, which he reduced to 24, including *Casuarina*. He divides the order into eight "series," namely: *Taxées*, *Cupressées*, *Junipérées*, *Athrotaxées*, *Nagéiées*, *Araucariées*, *Pinées*, and *Casuarinées*. The inclusion of the last is inexplicable, and some changes in nomenclature will not meet with general approval, *Belis*, Salisb. is revived for *Cunninghamia*, R. Br.; *Podocarpus*, Labill. for *Phyllocladus*, Rich.; *Agathis*, Salisb. for *Dammara*, Lamk., and *Nageia*, Gærtn. for *Podocarpus*, L'Hérit.

Sir Joseph Hooker has been for some years so incessantly occupied with the completion of his "*Flora of British India*" that the detailed study of the Kew Pinetum which, as will be seen, he had proposed to himself, is entirely beyond his powers. Kew has, however, had the advantage, in drawing up the present hand-list, of the assistance of Dr. Masters, F.R.S., who is now the acknowledged authority on the nomenclature of Conifers in this country. As a general rule at Kew, the *Genera Plantarum* is accepted as the standard of nomenclature. In the present case some deviations have been adopted, which have received the concurrence of Sir Joseph Hooker. Of these Dr. Masters has been so good as to furnish the following brief explanation:—

The arrangement of the genera in the following list differs in a few particulars from that adopted in Bentham and Hooker's *Genera Plantarum*. The principal difference consists in the maintenance of the *Taxaceæ* as a distinct order as originally proposed by Richard and followed by Endlicher, Lindley, and many other botanists. This arrangement permits of a more natural arrangement of the several taxaceous genera under two tribes, the *Salisburineæ* comprising *Ginkgo*, *Cephalotaxus*, and *Torreya*, and the *Taxineæ* including the two subtribes *Taxeæ* and *Podocarpeæ*. *Prumnopitys*, Philippi (with which *Stachycarpus*, Van Tieghem, is synonymous) is placed by Bentham and Hooker under *Podocarpus*, but the combination of morphological and histological characters points to the desirability of maintaining it as a separate genus.

Among the *Coniferæ* or *Pinaceæ* proper a few changes have been made from the grouping of Bentham and Hooker in accordance with the fuller knowlege of certain points of structure that is now available. *Tetraclinis* is proposed as a distinct genus, represented by the North African *Callitris quadrivalvis*, on the ground of its structure and geographical distribution. *Widdringtonia* is separated from *Callitris* for similar reasons.

The sub-divisions of *Cupressus* and of *Thuya* have been bandied about between the two genera. The genus *Cupressus*, as here understood, includes the Cypresses proper and the so-called flat Cypresses (*Chamæcyparis*), which Bentham and Hooker place under *Thuya*, and which others prefer to consider as a separate genus. *Retinispora*, it is now well known, has no claim to a separate generic position. The North-western American *Thuiopsis*, placed under *Thuya* by Bentham and Hooker, is more like a *Cupressus*, whilst the Japanese plant, known under the same generic name, is a true *Thuya*. Probably the fusion of *Cupressus* and *Thuya* into one genus would be the most natural arrangement, but in practice the inconvenience of such a grouping and the consequent confusion of the nomenclature would be almost intolerable.

Pseudolarix of Gordon is shown by the male flowers to constitute a distinct genus, as was indeed suspected by Bentham.

Keteleeria of Carrière, referred by Bentham to *Abies*, is also shown by the fuller knowledge we now have of its structure to constitute a distinct genus.

The collections of *Coniferæ* at Kew have occupied three different positions at successive times. According to John Smith's privately printed *Records of Kew* (p. 258), the original Arboretum consisted of about five acres. It lay between the Temple of the Sun and the present Main Entrance. It was laid out by W. Aiton on the Linnean system. "*Pinus* occupied the north and part of the east."

In the first edition of the *Hortus Kewensis* (1789) Aiton enumerates 36 species of *Coniferæ* as cultivated at Kew; in the second edition (1813) 56 species are recorded, "which formed the collection in the original Arboretum." Some of these still remain. According to Smith (p. 286), "within a few yards of the entrance gates on Kew Green stands a specimen of *P. Laricio* (the Corsican Pine). In 1825 the late R. A. Salisbury informed me that he brought it from the south of France in the year 1814; it is now (1880) 85 feet high, and the most conspicuous tree in the Gardens."

Ginkgo biloba (Salisburia adiantifolia), first introduced in 1754, was, according to Smith (p. 267), "originally trained against a wall like a fruit tree; upon the wall being taken down, and the branches cut away,

it is now (1880) a fine tree. When against the wall one of its side branches early produced male flowers." It again did so in 1895, and probably in previous years.

Cedrus Deodara was, according to Smith (p. 287), introduced "by the Hon. Leslie Melville, in the year 1831, who, on visiting the Gardens, gave me a few seeds which he had loose in his pocket, one of which vegetated, and after several years nursing was planted in the old Arboretum. . . . In 1864 it had attained a height of 32 feet." The tree became diseased and was taken down in 1888. Near its former position is one, now nearly as large, raised from seed ripened in England by Sir T. D. Acland, Bart.

In 1843, by permission of the Queen, about 45 acres were added to the original Botanic Garden for the formation of a Pinetum. This included the ground formerly bounded by a wire fence, on which the Palm House now stands, and to the north, west, and south of it. Smith (*Records*, p. 291) says:—"The area was planted with conifers . . . . without any special arrangement." Many of these still remain, and have attained a considerable size; one of the most conspicuous is the fine specimen of *Pinus monticola*, now 56 feet high.

Kew owes its existing Pinetum to Sir Joseph Hooker, who has always taken a peculiar interest in this ancient and striking group of plants. A visit to Syria in 1860 enabled him to study the Cedar of Lebanon in its native locality. Perhaps one of the most interesting achievements of the late Turkish Ambassador, Rustem Pacha, was his successful efforts, while Governor of Northern Syria, to preserve what was left of the ancient grove.

In 1877 Sir Joseph Hooker's interest in Conifers was one of the main influences which induced him to undertake an extensive journey in Western North America. He brought back a rich harvest of specimens, which were deposited in the Kew Museum.

The Kew Pinetum has been carefully developed on the lines which Sir Joseph Hooker laid down. These are sufficiently indicated in the following extract from his Report for 1872 (pp. 4-5).

Pinetum.—This, which is by far the most important and extensive collection in the grounds, is now all but completed. In my report for 1871 I stated that the genera *Abies*, *Picea*, and a few others had been planted along the new walk on the south side of the lake. These extend for 160 yards on both sides of the path, and are now succeeded by the collection of *Pinus* proper, which extends from the termination of *Abies* to the Isleworth entrance (340 yards), and thence along the lined out path (100 yards) that leads to the Sion vista. The collection of *Pinus* proper also extends 100 yards up the new path skirting the Queen's Cottage grounds, where it is succeeded by the collection of Yews, Cypresses, Retinisporas, Taxodiums, Thujas, and smaller American and Japanese genera.

The Juniper collection is planted on either side of an avenue leading through the woods from the Lake to King William's Temple, and extends for 200 yards.

The classified and named Pinetum thus extends along nearly 2000 yards of path and avenue, representing double that length, or two and a quarter miles of made soil, beds, and plantations, except where interrupted by old trees.

The plants are throughout so arranged that the Old World species are as far as possible placed opposite to the American species of the same genera, and there are on the average 3–12 specimens of each

species or conspicuous variety, placed in groups. The number of specimens is about 1200, all I believe correctly named, with the exception of some doubtful ones. Almost every species that can be grown in the open air in this country is represented. Very few have been bought, the majority being plants procured by exchange and correspondence with different parts of the world, and through the liberality of various eminent nurserymen.

Whenever possible, the specimens in the old Pinetum have been transplanted to this, in most cases with apparent success, but of this there is no assurance till the spring is over. The specimen Pines in the Botanic Garden have not been removed.

It is only necessary to add that at the end of a quarter of a century the original plan has met with as much success as could be expected, looking at the great variety of species which it is attempted to grow under almost uniform conditions. A barren and arid soil has been congenial to some groups and fatal to others. Pines have on the whole prospered, while Spruces and Silver Firs have languished. In the latter case the maintenance of a collection illustrating Conifers as a whole can only be effected by constantly renewing it with young plants. As soon as these reach any size, they appear, under the conditions to which they are exposed at Kew, inevitably to die. It may be interesting to mention a few of the species which flourish on the Kew soil.

Ginkgo biloba (Maidenhair Tree) has already been referred to. This remarkable tree, a last representative of one of the most ancient types of plants, is apparently nowhere known in the wild state. In Japan it is only found in the precincts of temples where it has been almost certainly planted. Being deciduous it tolerates the neighbourhood of towns, and it is remarkable that it has not been more frequently planted in our parks. But its growth is slow.

Sciadopitys verticillata (Umbrella Pine) is represented by a vigorous specimen.

Taxodium distichum (Deciduous Cypress) bids fair to form a conspicuous feature on the islands in the Lake.

Cedrus atlantica (Atlas Cedar) grows with great rapidity at Kew. The *Deodar* (Cedrus Deodara), on the other hand, has greatly disappointed the expectations formed of it. The most shapely and graceful specimen which Kew possessed, 45 feet in height, stood on the west side of the Pagoda Vista, between the Palm House and King William's Temple. It was unfortunately destroyed by lightning on August 10th, 1895. (*Kew Bulletin*, 1895, p. 235.)

Larix europæa (Larch) grows well at Kew. Scattered through the woods are many fine specimens, the wood of which is of excellent quality.

Abies brachyphylla, from Japan, grows with great rapidity, and promises to be one of the most successful additions to the Pinetum from that country.

Pinus Coulteri is represented by a very fine specimen near the Cactus House (No. V.).

Pinus Laricio (Corsican Pine) has already been referred to.

Pinus excelsa (Bhotan Pine) is represented by numerous vigorous specimens.

Pinus monticola has already been referred to.

Of the specimen trees in the Botanic Garden some have been already mentioned.

Perhaps one of the most notable was the first specimen of the Chili Pine (*Araucaria imbricata*), the history of which is given in the *Kew Bulletin* for 1893 (pp. 24, 25). It died, and was removed in the autumn of the preceding year.

Several of the tender Conifers grown in the Temperate House are fine specimens of some age.

Agathis australis (Kaari Pine) was introduced to Kew in 1838 by "Sir William Symonds, then Surveyor-General of the Navy" (Smith, *Records*, p. 289).

Agathis robusta, according to Smith (*Records*, p. 290), was introduced to Kew in 1852, and grew freely in the Palm House. It was subsequently removed into the Temperate House, the conditions of which seem to suit it even better.

Araucaria Bidwillii (Bunya Bunya) was brought to this country in 1846 by Mr. T. Bidwill, who "was superintendent *pro tem.* of the Sydney Botanic Gardens" (Smith, *Records*, p. 67).

Araucaria Cunninghamii (Moreton Bay Pine) was discovered by Allan Cunningham in Queensland (probably about 1826), who forwarded plants to Kew, of which the existing specimen is the survivor. Some years ago it was much disfigured by a gust of wind which carried off about 25 feet of the top. The stump was trimmed, and a new leader was speedily produced, which eventually restored the symmetry.

Araucaria excelsa (Norfolk Island Pine), a native of Norfolk Island, according to Smith (*Records*, p. 66), introduced to Kew from New South Wales in 1793, by Governor Phillips (first Governor of New South Wales). The necessity for providing adequate accommodation for this and other striking plants led to the erection of the Temperate House, to which they were transferred in 1863. The habit of the specimen at Kew, which is now more than a century old, is a good deal altered (and perhaps improved) by the pruning necessary to keep it within bounds, even in its present position.

DXVI.—TROPICAL FODDER GRASSES.—

(continued).

We are indebted to Mr. Francis Watts, F.C.S., F.I.C., Government Analytical Chemist at Antigua in the Leeward Islands, for the following notes on certain fodder grasses that have been the subject of recent investigation by him:—

The accompanying analyses and notes may be of interest in connexion with the articles on Tropical Fodder Grasses in the *Kew Bulletin* (1894, pp. 373–387, and 1895, pp. 209–211), as supplying data concerning the food value of some of the grasses growing in the West Indies. It is hoped that time will be found to extend this series of analyses, but owing to pressure of other work, this will probably be only at irregular intervals.

Andropogon pertusus, Willd. Sour grass. This aromatic grass has been already described (*Kew Bulletin*, 1895, p. 210). It is doubtless one of the most valuable West Indian fodder grasses. It gives a large yield of hay in proportion to the weight of the fresh grass.

Chloris barbata, Sw. An annual grass, common along roadsides. As stated by Duthie, cattle do not appear to eat it when in flower.

Panicum prostratum, Lam. Cent. per cent. grass. A creeping grass, reported to be highly valued as a fodder. It yields a rich hay, but as the fresh grass contains a large amount of water, the yield is small.

Panicum colonum, L. Rice grass. This annual grass springs up rapidly after rain, and yields a very rich hay, but like the last, owing to the large proportion of water in the fresh grass, the yield of small.

Andropogon caricosus, L. Hay grass of Antigua. This is described by Mr. Barber in his "Notes on Antigua Grasses" in the Supplement to the *Leeward Islands Gazette*, October 4th, 1894 (*Bulletin* XXXII., p. 166):—

A grass which has many good points in its favour has largely established itself in the uncultivated land in the neighbourhood of Clare Hall. It has completely taken possession of the Gambles pasture between Skerretts and the town of St. John's.

Specimens sent to Jamaica and Kew were differently named; but, assuming the Kew determination to be correct, it appears to be *Andropogon caricosus*.

I do not at present know of it in any other West Indian Island, and some surprise was expressed at Kew at its presence in Antigua, because it is an East Indian species. It would be an interesting puzzle to determine how it found its way into our island.

It is known locally as a '*hay grass*,' and, if cut at the right time, should prove to be a very valuable fodder plant. The young blades clothe the ground with a beautiful coat of green, and it might be cut and stacked at the height of one or two feet according to locality. But the exact moment to cut it for hay is after the pollen has fallen, and before the seed has swollen. When the seed swells it draws for its nutrition from the stores in the stalks of leaves, and very little then is added to the plant from the ground. The seed is lightly detached, and then the grass is fit for little but bedding. One has a great advantage in deciding the time for cutting, in the fact that this grass monopolises the land to the exclusion of other species. It is difficult in mixed fields to choose the right moment for cutting, because the different species ripen at different times. Here no such difficulty is met with.

A marked feature in the grass is its variability according to soil, and its ready response to cultivation. While it may be frequently met with on the roadside one to two inches in height, in good rich land it will form a dense mass four feet high.

There should be no difficulty in cutting it by means of a mowing machine, and if done at the right time, probably at least two crops may be obtained in the season.

A great improvement is noticed if the land is lightly scratched by a cultivator after cutting. I have in mind a piece of land on the Clare Hall pasture which was cleared and lightly hoed, preparatory to the erection of buildings, I believe. The patch was, however, allowed to revert to pasture. When shown to me six months afterwards, it had been converted into a uniform piece of hay grass, with numbers of vetches or "winers" scattered amongst the grass.

The grass is not regarded as one of the first class Indian fodders, probably because of the widespread use of such others as the Bahamas

grass. A large quantity of fairly good fodder is said, however, to be obtained from it."

This grass appears to be an introduced species; it is spreading steadily, and where found is highly valued. Some attempts are being made to aid the spread of it by the distribution of seed. It is readily eaten by stock, and during the terrible drought of 1894 the heavy growth of this grass, which had dried *in situ*, on the pastures, formed the chief fodder for the animals at the Government Stock Farm at the Skerretts in this Island; it was freely eaten in this condition, and the animals throve upon it.

The following amounts of hay and water were yielded by these grasses when weighed immediately after cutting.

100 parts of fresh grass yielded the following weights of hay:—

—	Percentage of Hay.	Percentage of Water.
Andropogon pertusus (Sour grass)	60	40
Chloris barbata	35	65
Panicum prostratum (Cent. per cent.)	21	79
Panicum colonum (Rice grass)	18	82
Andropogon caricorus (Hay grass)	30	70

It is important to remember the very wide differences in the yield of hay when fodder is purchased in a green state. Probably the small proportion of water in "Sour grass," *Andropogon pertusus*, accounts in some measure for the esteem in which it is held as a fodder in Barbados and elsewhere.

All these grasses are described in Duthie's "Fodder Grasses of Northern India." Specimens are forwarded herewith in order that there may be no mistake as to the identity of the grasses analysed. The analyses were made on samples of grass cut when in flower, and the seed was just forming.

Tables of Analyses.

Composition of Hay.

—	Water.	Ash.	Nitrogen. Total.	Crude Protein.	Albuminoid Nitrogen.	True Protein.	Fibre.	Nitrogen, Free Extract.	Fat.
Andropogon pertusus (Sour grass).	10·92	5·50	·808	5·05	·700	4·378	29·75	37·71	2·075
Chloris barbata	17·02	10·82	2·09	13·06	1·172	7·328	25·53	32·69	·884
Panicum prostratum (Cent. per cent.).	11·06	12·92	2·37	15·40	1·424	8·903	24·90	34·48	1·240
Panicum colonum (Rice grass).	15·62	12·91	2·649	17·21	1·648	10·303	23·69	29·54	1·025
Andropogon caricosus (Hay grass).	12·14	9·07	·738	4·79	·472	2·835	34·57	38·61	·820

Composition of Fresh Grass. Calculated from above.

—	Water.	Ash.	Nitrogen. Total.	Crude Protein.	Albuminoid Nitrogen.	True Protein.	Fibre.	Nitrogen, Free Extract.	Fat.
Andropogus pertusus (Sour grass).	46·55	3·30	·484	3·03	·420	2·626	17·85	22·62	1·245
Chloris barbata -	70·95	3·78	·731	4·57	·410	2·564	8·93	11·44	·309
Panicum prostratum (Cent. per cent.).	81·67	2·66	·488	3·17	·293	1·834	5·12	7·10	·261
Panicum colonum (Rice grass).	84·81	2·32	·476	3·09	·296	1·854	4·26	5·31	·184
Andropogon caricosus (Hay grass).	73·64	2·72	·221	1·43	·141	·850	10·37	11·58	·246

FRANCIS WATTS.

Government Laboratory,
Antigua, West Indies,
7th January 1896.

DXVII.—COTTON IN BRITISH CENTRAL AFRICA.

Cotton has long been cultivated in Central Africa. On the Zambesi and elsewhere it is now semi-wild.

The following correspondence relates to a sample of the produce sent to Kew by Her Majesty's Commissioner in British Central Africa:—

HER MAJESTY'S COMMISSIONER AND CONSUL-GENERAL, BRITISH CENTRAL AFRICA, TO ROYAL GARDENS, KEW.

Zomba, British Central Africa,
DEAR THISELTON-DYER, October 19, 1895.

I SEND you by this post in a small canvas bag a specimen of the half-wild cotton of this country. It is cultivated by the natives in an indifferent manner since some 15 years ago, when they ceased weaving any cloth from their own cotton, preferring to buy the European manufactured goods.

This cotton is sent to me by a planter in the vicinity who states that he believes it to be of very good quality. Could you have it reported on, and let me know whether it really is a cotton which would fetch a high price? Opinions are divided as to whether it is or it is not worth our while to cultivate cotton. It grows half wild about the country, but it is said that the transport to the coast, which would cost about an average of 6*l*. a ton, would leave little or no profit to the planter.

Believe me, &c.
(Signed) H. H. JOHNSTON,
Her Majesty's Commissioner and Consul-General.

SECRETARY, MANCHESTER CHAMBER OF COMMERCE TO ROYAL GARDENS, KEW.

Chamber of Commerce, Manchester,
DEAR SIR, January 9, 1896.

I HAVE obtained an expert opinion upon the sample of Central African cotton referred to in your letter of the 6th instant, and have pleasure in reporting thereupon.

The fibre is of a woolly character, but it is clean and bright, though a good deal discoloured by what appear to be insect stains. The length of the staple is $1\frac{1}{8}$ inch to $1\frac{3}{16}$ inch, varying considerably in strength, but it is mostly very tender. It could probably be sold here at about $4\frac{1}{4}d.$ per lb. at the present time.

Faithfully yours,
(Signed) ELIJAH HELM,
Secretary.

John R. Jackson, Esq.,
Kew Museum, Kew.

DXVIII.—SISAL CULTIVATION IN THE TURKS AND CAICOS ISLANDS.

The steps taken to establish a fibre industry in these islands were described in the *Kew Bulletin*, 1890, pp. 273–278. The plants under cultivation were determined at Kew to be identical with those grown in the Bahamas (*Agave sisalana*). A further account of the industry was given in the *Kew Bulletin*, 1892, pp. 31 and 32. In the following extract from a letter addressed to the Commissioner, Turks Islands, the Assistant-Commissioner reports that the plants are in excellent health, and the only difficulty is the want of sufficient machines to clear the leaves as they arrive at maturity. Since this report was written it is stated that machines have been introduced, and the export of fibre is likely to be greatly increased:—

Extract from a letter from the Assistant-Commissioner, Cockburn Harbour, to Commissioner, Turks Islands, dated 31st December, 1895.

"Of the Sisal industry I cannot say much. At West Caicos, it would seem, if output be the criterion, much is not being done; what is, would appear to be directed to weeding, clearing and systematic cultivation, rather than to shipment of the clean baled products. A limited number of the Blue Hills or Providence Cays people here get employment.

"In my recent visit to the scene of the wreck of the steamship 'Dorian' I travelled day after day for a week through these great stretches under cultivation by the East Caicos Fibre Company, a succession of regular well ordered tracts of some 1,200 acres in all. The growth and stages of maturity clearly enough mark the different yearly plantings with ample roads and plant space.

"The crop is far the finest I have ever seen in the Bahamas. I visited the cleaning sheds; the machinery is not equal to a third of the work to be done. There are very many leaves fit for cutting that lie untouched, and there are more plants poling than one would wish to see. I suppose that the condition of the market governs the business, but certainly there are scores of acres that require cutting.

"The labour afforded at Jacksonville in this hard year helped very considerably to alleviate the prevailing distress of the out-islanders."

In the Colonial Office Reports, No. 174, of 1896, it is stated that:—

"The export of sisal or Bahama hemp from the Turks and Caicos Islands is gradually on the increase, the value declared for 1895 being 620*l.* With the additional and improved machinery recently put up by each of the two companies engaged in this business, the output will probably be much larger."

DXIX.—SACRED TREE OF KUM-BUM.

The following communication from the Director was published in *Nature* for March 5, last :—

The eighth number of the *Bulletin du Muséum d'Histoire Naturelle* for 1895, which has just reached me, contains a paper by M. Édouard Blanc, entitled "L'Arbre à prières de Goumboum." This reminds me of a brief article which I contributed to *Nature* in 1883 (vol. xxvii. pp. 223, 224).

M. Blanc begins his account by the remark: "Je veux parler du fameux arbre qui croît dans un monastère buddhiste, au nord du Thibet, et qui produit des lettres, des mots, des prières et autres formules religieuses, le plus souvent tracées sur son écorce et sur ses feuilles." Of the actual fact he adds, "des voyageurs européens, M. Potanine et M. Grenard entre autres, ont apporté le témoignage de leur observation directe."

It is evident, then, that the tree still exists much as Huc and Gabet described it. And M. Blanc brought back with him to Europe a branch and a portion of the trunk. He says: "Le phénomène est véritable : il existe réellement, et j'ai vu des caractères thibétains très nettement tracés sur les branches de l'arbre en question."

M. Blanc discusses the cause. He dismisses the probability of their being either natural markings or the work of insects accidentally resembling alphabetic characters. He has no doubt that they are produced artificially, probably with the aid of heat.

In 1891 Mr. William Woodville Rockhill's book, "The Land of the Lamas," appeared; in it (pp. 67, 68) he gives the following account of the tree :—

"Although I did not see the convent treasure-house and the 'white sandal-wood tree' until later, I will describe them here. In a small yard enclosed within high walls stand three trees about twenty-five to thirty feet high, a low wall keeping the soil about their roots. These are the famous trees of Kum-Bum, or rather tree, for to the central one only is great reverence shown, as on its leaves appear outline images of Tsong-k'apa. The trees are probably, as conjectured by Kreitner,* lilacs (*Philadelphus coronarius*); the present ones are a second growth, the old stumps being still visible. There were unfortunately no leaves on the tree when I saw it; and on the bark, which in many places was curled up like birch or cherry bark, I could distinguish no impress of any sort, although Huc says that images (of Tibetan letters, not images of the god) were visible on it. The lamas sell the leaves, but those I bought were so much broken that nothing could be seen on them. I have it, however, from Mohammedans that on the green leaf these outline images are clearly discernible. It is noteworthy that whereas Huc found letters of the Tibetan alphabet on the leaves of this famous tree,

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* Kreitner, "Im Fernen Osten," p. 708. I was told that in spring these trees have large clusters of violet flowers, but if they are lilacs I am astonished that the Chinese do not speak of them as such, for that shrub is well known in Kan-su and throughout Northern China (*see* Prjevalsky. "Mongolia," ii. 79). Tibetans call all sweet-smelling wood *tsandan* (*i.e.* sandal-wood). Sir Joseph Hooker (*Himalayan Journals*, i. 298) says that the Lepshahs and Bhoteas call the funereal cypress *tsandan*. The Kum-Bum *tsandan karpo* is certainly not a cypress, however.

there are now seen only images of Tsong-k'apa (or the Buddha ?). It would be interesting to learn the cause of this change."*

I was anxious to see what could be ascertained from the leaves brought back by Mr. Rockhill. An application to my friend Prof. Sargent, at Harvard, procured me the following interesting letter :—

1914 N Street, December 23, 1893.

My Dear Sargent,

As regards the famous Kum-Bum tree, I was not permitted, in any of my visits to it, to touch the tree, but I got a lot of leaves fallen from it, some of which I gave to the British Museum (Department of Ethnology), where Franks or Read would, I doubt not, be pleased to show them to Dyer.

From what the people at Kum-Bum told me, especially in view of their reference to the big bunches of violet flowers, I *thought* the tree might prove to be a lilac.

The bark turns up on the trunk like that of a birch. Kreitner is responsible for the identification of this "white sandal-wood" with the *Philadelphus coronarius*.

The roots from which the trees I saw were growing look very old, how old I cannot say, being ignorant in all such matters, the live stems are certainly not over 15 to 20 feet in height, and 4 to 6 inches diameter at the root, and some of them look very healthy. It may be that when Huc and Gabet visited this place (in 1842, I believe) the original trunk was yet alive.

They say that "three men could not stretch around the trunk," but he adds that it was not over 8 feet high. He must refer to an old dead trunk, out of which shoots were gowing. If this is not the case, we cannot have seen the same tree; that is all there is about it.

As to the "odeur exquise et qui approche un peu de celle de la cannelle," this must be hearsay, and refers to the popular belief that the tree is a sandal-wood, or else is a native simile for the odour of lilacs.

The large red flowers Huc also refers to may be violet ones. Mongol is not so precise a language, in fact certain colours which we would call violet are invariably called red by them.

Huc mentions the curling up of the bark.

On the whole, I am inclined to think that here as throughout his book, Huc's reminiscences of facts and hearsay have misled him. He certainly could not see the image on the leaves or bark, for even the Kum-Bum lamas, to whom I mentioned my inability to detect anything on the leaves they had given me, assured me that *faith was necessary*— "as one's faith is so is the clearness of the image on the leaf."

I hope the leaves will assist in throwing some light on the question.

Ever sincerely yours,

(Signed) W. W. Rockhill.

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* When Lieutenant Kreitner visited this place (1879), the images on the leaves were as at the present time. *See* "Im Fernen Osten," p. 707. The Arab traveller, Ibn Batuta, saw in the fourteenth century, at Deh Fattan, on the Malabar coast, in the courtyard of a mosque, a tree called "the tree of testimony." Every year there was a leaf on it, on which was written "by the pen of divine power" the formula "There is no God but God; and Mohammed is the envoy of God." The inhabitants used it to cure disease (*see* Ibn Batutah, Defrémery's Transl., iv. 85).

Sir Augustus Franks kindly sent me some of the leaves, accompanied with the following memorandum:—

"Leaves from the tsandan karpo ('white sandal-wood tree') of Kŭmbŭm, said to have sprung up on the spot where Toongkàpe's mother threw his hair when, having shaved his head, she consecrated him to the house.

"Used when ground as medicine—also carried in charm boxes.

"Collected by W. W. Rockhill at Kŭmbŭm in 1891."

They were carefully examined by Mr. W. B. Hemsley, F.R.S., Principal Assistant in the Kew Herbarium, who has long been engaged on a critical study of the Chinese Flora. He arrived at the conclusion that they belonged to *Syringa villosa*, a Chinese species. He published his determination in *Journ. Linn. Soc.*, (vol. xxx., p. 133), and I am disposed to regard it as correct. It confirms the statement of Kreitner (*Nature*, xxvii. p. 171).

Rockhill's identification with *Philadelphus* is a mistake easy of explanation. He has confused the popular and the scientific use of the name Syringa. Lilac is botanically *Syringa*; Syringa is botanically *Philadelphus*.

It will be seen from the accounts given above that the phenomenon is not consistent with itself at different times. This confirms the opinion of M. Blanc that it is an elaborate fraud.

W. T. Thiselton-Dyer.

P.S.—I have omitted to add that Blanc says (*l.c.* p. 323):—"L'arbre paraît appartenir à la famille des Phytolaccacées ou à une famille analogue."—W. T. T. D.

DXX.—MISCELLANEOUS NOTES.

The Botanical Magazine for March.—The drawings of all the subjects figured were made from plants that flowered at Kew. *Incarvillea Delavayi* is a handsome new species from Western China, discovered by the Abbé Delavay. Kew is indebted to Mr. Max Leichtlin of Baden Baden for a plant of it. *Comanthosphace japonica* is a singular labiate from Eastern Asia. It was raised at Kew from seed presented by Prof. C. S. Sargent, Director of the Arnold Arboretum, Harvard. *Dipodium paludosum* is a pretty orchid, at home in the marshes of the Malay Peninsula. Kew received a plant from Mr. F. W. Moore, the Curator of the Glasnevin Botanic Garden. *Massonia jasminiflora*, a native of the Orange Free State, and a species of little ornamental value, was sent to Kew by the Rev. F. O. Miles, of Almonbury, Bristol. *Utricularia janthina* is a very fine Brazilian species, imported by Messrs. Sander and Co. Like some other species it grows epiphytically, in th axils of the leaves of a species of *Vriesia*.

Botanical Magazine for April.—The plants figured are *Posoqueria macropus*, *Hypocyrta pulchra*, *Olyra concinna*, *Catasetum Randii*, and *Phaleria ambigua*; all from plants cultivated at Kew.

Posoqueria macropus, a native of Brazil, is remarkable for its long, tubular, fragrant flowers. *Hypocyrta pulchra* was obtained from Messrs. J. Veitch and Sons, who had imported it from New Granada It is the most brilliant-coloured species of the genus. *Olyra concinna*

an elegant grass, native of Costa Rica, was received at Kew in 1891, in a box of filmy ferns, sent by Mr. C. Winkler from San José. Plate 7470 represents a male plant, and one female flower of *Catasetum Randii*, which was described in the *Bulletin*, 1894, p. 394. A living male plant was communicated to Kew by E. S. Rand, Esq. of Para, from which, when it flowered in March 1895, the present drawing was made. The female flower was received from the same gentleman, preserved in alcohol. *Phaleria ambigua*, a native of Java, is a climbing shrubby plant allied to *Daphne*. It was sent to Kew by Dr. Treub, Director of the Buitenzorg Botanical Gardens, to whom we owe many interesting additions to the Royal Gardens.

Botanical Magazine for May.—*Ostrowskia magnifica*, a remarkably showy plant, allied to *Campanula*. The drawing was made from an exceedingly vigorous specimen communicated by F. Ducane Godman, Esq., F.R.S. It is a native of Central Asia, where it grows at an elevation of 7000 feet. *Pittosporum eriocarpum*, a native of the Himalaya, is a handsome species, which may prove hardy in the south-western parts of the British Islands. The specimen figured was received from Marchese Hanbury, F.L.S. The drawings of *Cochlioda noezliana*, *Coffea stenophylla*, and *Masdevallia corniculata*, var. *inflata* were prepared from plants cultivated at Kew. *Cochlioda noezliana*, native of Peru, was discovered by Mr. John Noezli, who sent it to Messrs. Linden in 1891. The Kew plant was purchased. *Coffea stenophylla* is one of the two indigenous West African species which are becoming important commercially (*Kew Bulletin*, 1893, p. 167). It was raised from seeds sent from Kew in May 1894, by Sir W. H. Quayle Jones, late Chief Justice of the West African Settlements, and Acting Governor of Sierra Leone. The *Masdevallia*, a native of New Grenada, was received at Kew from the fine collection at Glasnevin, under the superintendence of Mr. F. W. Moore.

Hooker's Icones Plantarum.—The third part of the current volume, containing plates 2451 to 2475, illustrates a number of interesting plants from Borneo, China, Madagascar, Tibet, and other countries. Among the Bornean plants, *Creaghiella*, an ornamental new genus of Melastoniaceæ, and *Baphia borneensis*, are specially noteworthy. The latter is an outlying member of a remarkable genus of the Leguminosæ, otherwise only known from Tropical Africa and Madagascar. *Platykeleba*, a new genus of Asclepiadeæ, from Madagascar, is a small leafless shrub belonging to the tribe Cynancheæ. The Chinese flora is represented by *Lithospermum hancockianum* and *Elæocarpus hainanense*, both very handsome, and *Pterygiella*, a new genus of Scrophularineæ, allied to *Euphrasia*. Plates 2467 to 2472 are devoted to novelties from Mr. Littledale's Tibetan collection, made at an elevation of about 16,500 feet. They include a new species of the rare and curious genus *Oreosolen* (Scrophularineæ), and *Littledalea*, an elegant new grass, allied to *Glyceria*. This is of a beautiful purple colour, at least when dry. *Ischnochloa* and *Duthiæa* are two new genera of grasses from North West India. *Pentadesma butyracea*, the "butter tree" of West Tropical Africa, is for the first time adequately figured. And *Homalopetalum* is a new genus of orchids, of the tribe Epidendreæ, from the Blue Mountains of Jamaica, characterised by having all the parts of the perianth alike in size and shape.

Flora Capensis.—The continuation of this work, of which three volumes were published by Harvey and Sander, has been resumed. It was brought to a standstill by the death of both authors, and the last volume was published in 1865. Part I. (pp. 1–192) has now been issued under the authority of the Governments of the Cape of Good Hope and Natal, and the editorship of the Director.

The following statement is an extract from the prefatory note :—

The three published volumes of the *Flora Capensis* only included the southern portion of South Africa outside the tropics. In the continuation it is intended to describe, as far as possible, all known flowering plants occurring in the area lying between the tropic of Capricorn and the ocean. To the north it will be supplemented, therefore, by the *Flora of Tropical Africa*.

The volume, of which the present part is an instalment, will be of more than ordinary interest to horticulturists as well as to botanists, as it will include the whole of the plants known familiarly as "Cape Bulbs." The cultivation of these was popular on their introduction by Masson at the end of the last, and by Bowie at the beginning of the present century, and the taste for them has of late years revived. The present part includes the whole of the *Irideæ*, which from a cultural point of view are peculiarly attractive. The volume has long been in preparation, but its publication has been from time to time delayed by the desire to include in it the novelties which have been continually received as new territories to the north have been explored. It has been entirely elaborated by Mr. John Gilbert Baker, F.R.S., the keeper of the Herbarium and Library of the Royal Gardens, who has long been the accepted authority on the Petaloid Monocotyledons.

The whole area occupied by the flora has been broken up into regions, the physical characters of which will probably be found tolerably well marked. These have been adopted in great part from the important paper, "Sketch of the Flora of South Africa," by Harry Bolus, Esq., F.L.S., printed in the Cape of Good Hope "Official Handbook," at the Colonial and Indian Exhibition, 1886 (pp. 286–317).

They may be briefly defined as follows :—

i. Coast Region.—Includes the narrow belt lying between the south-western and southern coasts from the Oliphants to the Kei rivers and the Zwarte Bergen range.

ii. Central Region.—Can only be roughly defined as lying between the coast and the Kalahari regions.

iii. Western Region.—Extends from the tropic to the Oliphants river, and includes Great and Little Namaqualand.

iv. Kalahari Region.—Includes the Kalahari, Bechuanaland, Griqualand West, Transvaal, Orange Free State, and Basutoland.

v. Eastern Region.—Includes the belt lying between the eastern coast from the Kei river to the tropic and the Drakens Berg range. It therefore comprises Natal, Zululand, Griqualand East, &c.

The plants of the older collectors, which are often destitute of precise localities, have been simply referred to under the general head of South Africa.

Botanical Department, Jamaica.—The late Governor of the Colony took occasion to give emphatic testimony to the value of the work done by the Department of Public Gardens and Plantations :

EXTRACT from a PAPER by His Excellency General Sir H. W. NORMAN, G.C.B., G.C.M.G., &c., read before the AUSTRALASIAN ASSOCIATION for the ADVANCEMENT of SCIENCE, at Brisbane, Queensland, January, 1895.

A WEST INDIA ISLAND [JAMAICA].

I must not omit to mention that there is a botanical department in the island, with large gardens and plantations at different elevations, where much experimental cultivation is carried on. It is, no doubt, greatly owing to the exertions of this department that the fruit trade has become so important, and there now seems a prospect of tea being grown in some quantity. The cultivation of cinchona, which was commenced with some spirit several years ago, has not been so successful as was anticipated. This, no doubt, has been in some measure due to the great fall in the price.

It is interesting to note that nearly all the valuable trees and plants which now abound in Jamaica have been brought from other parts of the world. The sugar-cane, coffee, the logwood, the mango, the nutmeg, the bamboo, and many others have all been imported, as well as the guinea-grass, which enables large quantites of good cattle and horses to be raised and nourished. (Report, p. 481).

Trinidad Vanilla.—A sample of Vanilla grown and cured at the Botanic Gardens, Trinidad, was lately received from Mr. J. H. Hart, F.L.S., the Superintendent. The pods were produced by plants originally supplied from Kew, of what is known as the "Sion House variety," of *Vanilla planifolia*, Andr. In the present instance the quality is not so good as might be desired; but now the right sort is established in the island it might be worth while to carry on further experiments with the view of improving the quality of the produce :—

MESSRS. BURGOYNE, BURBIDGES & CO. TO ROYAL GARDENS, KEW.

12 and 16, Coleman Street,
London, E.C.,
February 12, 1896.

DEAR SIR,

I AM in receipt of your favour of the 8th instant enclosing samples of Vanilla beans grown in Trinidad.

These beans are somewhat mixed in character, and do not appear to be very well cured; they are, however, fairly meaty, but their flavour is coarse. They would be worth nominally from 10*s.* to 11*s.* per lb.

I remain, &c.
(Signed) H. ARNOLD.

J. R. Jackson, Esq.,
Museum, Royal Gardens, Kew.

Timber in Newfoundland.—The lumber industry has made extraordinary progress in Newfoundland in the last five years. The following

particulars are taken from the *Annual Report for* 1894 presented to Parliament in May, 1896 :—

It affords me much gratification to again report most favourably upon this branch of our industries. Its expansion has been most rapid, as the following comparative statement will show :—

Year.	M feet.	Valued at
		$
1888	30	360
1889	5	50
1890	1,329	21,180
1891	1,431	28,620
1892	2,355	47,100
1893	3,073	45,986
1894	6,357	82,641

The above gives the amount exported, but in addition to this a very large quantity is annually used for home consumption.

In this connexion I would observe that the amount of timber which has been destroyed by forest fires in this Colony is exceedingly large, and can only be appreciated by those who have travelled much in the interior. Forest fires are no doubt due occasionally to lightning, but most of them are traceable to the carelessness of hunters and travellers. In the partially inhabited regions, fires originate by the settlers burning brush and logheaps in clearing the land. The question has arisen as to whether anything can be done to prevent this destruction of the timber of the country. There is a law upon the Statute Book which deals with the subject, but no adequate means have heretofore been provided for enforcing it. It is considered that the appointment of conservators or forest guardians whose duties, in addition to preventing the destruction of the timber by fire and otherwise, might be directed to promoting the growth of existing timber, checking the stumpage upon granted areas and preventing encroachments upon ungranted Crown lands, will undoubtedly repay the cost that will be entailed. These officers will have the power to arrest or lay information against persons suspected or known to have wilfully, or by their negligence, set fire to the woods. As matters now stand, many guilty persons are allowed to escape through the reluctance or fear which disinterested or private individuals may have in regard to informing against them.

Shirley Poppy.—The origin of this attractive garden annual has been investigated by Dr. Prain (*Journ. As. Soc. Beng.*, 1895, pp. 306, 307). He says:—

"The form seems to have originated in Indian gardens, and is supposed to have very recently been introduced to European culture. This is, however, not quite exact, for the poppy now known as the Shirley Poppy, which seems to be undoubtedly *P. Rhœas*, var. *latifolia*, has been in continuous cultivation in Scotland for over half a century." It is *P. Hookeri*, Bak., figured in the *Bot. Mag.* t. 6729.

Typical *P. Rhœas* is stated by Dr. Prain to be "an extremely rare plant in India."

Trichopteryx elegans.—The genus *Trichopteryx* belongs to the tribe Aveneæ of grasses, and is a small one, of which all but one of the species are confined to Tropical and South Africa. We are indebted to a correspondent in British Central Africa for the following interesting account of the mode of dispersion of the seeds. This may be added to the instances, the general mechanism of which is discussed by Mr. Francis Darwin in the *Trans. Linn. Soc.* (*Bot.*) vol. i. (1880), pp. 149–167.

EXTRACT from letter from Mr. Kenneth J. Cameron to Royal Gardens, Kew, dated Namasi, January 7, 1896.

In this part of Africa there is a grass which any person travelling through the bush is almost sure to have some experience of. One end of the seed of this grass is very sharp, so that it can penetrate any clothes, and there are hairs or bristles on it arranged so that wherever it enters these hairs prevent it from returning the same way. Upon every movement this seed penetrates until it reaches the flesh, the result being a constant itch until it is removed. This grass grows fully 6 feet high, and is a common grass for thatching. My attention was drawn to this grass upon hearing a constant rustle among it just about sunrise. I examined it and found almost all the awns with seed attached twisting and turning in all directions, and latterly dropping to the ground where this movement was continued. The cause of this movement was the rays of the sun striking the grass and the heat had affected the awns. Since then I have taken more interest in this movement. If the awns are laid in shallow water they commence to move, or a change of temperature has the same effect. I have seen the awns fall on a box of soil, quite a lot of them, all over the surface, some time after they would find their way to the side of the box and penetrate between the side of the box and the soil, the end with the seed in the ground and the awn standing perpendicular. Had there been a hole or indent in the soil some would penetrate there. Supposing a perfectly level hard piece of ground with no grass on it; place a stone in the centre and let these awns fall all over the ground. The awns coming across this stone in their movements will penetrate between the stone and the soil, the seed end in the intersection. The awn has two joints dividing it into three parts.

Suppose it to be lying flat, its first movement is lifting the seed end clear of the ground or surface. When there are a lot together they form a ball or bunch and roll along. Upon reaching their destination they stand straight up with the seed in the ground. When there are a large quantity they form quite a mat. At the joints there is a screw-like formation, which either coils or uncoils in its movements.

Rhodomyrtus tomentosa.—Mr. Proudlock, curator of the Government Gardens in the Nilgiris, has recently drawn attention to this plant, which is known to Europeans at Ootacamund as the "Hill Gooseberry." The fruit is about the size of a cherry, dark purple, with a sweet and aromatic pulp. It is eaten raw or made into jam. The latter is known as "Thaouty," and is highly esteemed. The jelly is also excellent. A specimen received for the museum at Kew had some resemblance to apple jelly, but was not quite so sharp. The plant is very common on the higher mountains in Southern India, and extends to Ceylon and the Malay Peninsula. It is cultivated in two forms in the Temperate House

at Kew, and forms an attractive plant. It has also been grown to a limited extent in greenhouses in this country for the sake of its large pink flowers, which are ½ to ¾ inches across.

In the Nilgiris *Rhodomyrtus tomentosa* is a shrub 4 to 5 feet high. The young branches and leaves are clothed with a thick tomentum. The lower leaves are generally in threes, while the upper ones and those of the branches are opposite; they are 1 to 2½ inches long, with three, or rarely five, prominent nerves, dark brown and shining above, hoary beneath. The flowers are arranged one to three together on stalks about one-half the length of the leaves. The wood, usually of small size, is white with a pink heart, "the grain close and cutting like cheese"; it is useful for small turnery. In sub-tropical countries the plant might be usefully introduced both as an ornament and to supply fruit. The latter could no doubt be greatly improved by cultivation. It would be more desirable in every way than the Guava and similar myrtaceous fruits.

Sechium edule.—This cucurbitaceous plant, commonly known in the West Indies as the Chocho, Christophine or Vegetable Pear, was fully described in the *Kew Bulletin*, 1887, for August, p. 6. It was there stated that "the introduction of this useful plant to some of our "possessions in the East Indies was effected during the last two or "three years, and already very gratifying accounts have been received "of it."

The following extract taken from the *Annual Report on the Government Gardens and Parks in Mysore* for the year 1894-95, p. 12, shows that the Chocho has now been taken up by the natives of India, by whom it is regarded as one of the most wholesome of foods:—

"One practical outcome of the Nundydroog nursery is that the cultivation of 'Chocho' (*Sechium edule*) has been taken up in several villages at the foot of the hill. The labourers who are occasionally employed from these villages will, in all probability, utilise other garden products in the same practical manner. Chocho is now quite established as a popular vegetable in Bangalore and the adjacent villages. The fruit has also been widely distributed to other towns in the province. It is largely used in the Central Jail, where the fruit is carefully grown, and considered to be one of the most wholesome foods for prisoners. It is not generally known, however, that the large fleshy root of the plant, 'sometimes weighing nearly 20 lbs.,' can be cooked and eaten like a yam."

The chocho is also being grown in this country under glass to supply Covent Garden Market. It lends itself very readily to the same conditions as those adopted for tomatos, grapes, and cucumbers, but hardly requires so much heat as the latter. The large flat single seeds, if carefully cooked, are regarded as a great delicacy.

Erratum.—For "Shiruba," last line but one, page 85, read "Shimba."